What is claimed is:

1. A process for the production of opal-like or inverse opal-like sphere-based crystals comprising:

(a) adding a suspension of monospheres to a flat moving bed filtration membrane;

(b) moving the monospheres on the moving bed filtration membrane over a vacuum filtration zone to apply vacuum filtration pressure to the monospheres to obtain packed monospheres;

(c) processing the packed monospheres for stabilization, said processing comprising heating and/or chemically bonding the packed monospheres.

2. A process according to claim 1, wherein processing of the packed monospheres for stabilization comprises infiltrating the packed monospheres with a chemical bonding agent.

3. A process according to claim 2, wherein the infiltrating step is accomplished while the packed monospheres are moving on the vacuum bed filtration membrane and while a vacuum filtration pressure is being applied to the packed monospheres.

4. A process according to claim 2, further comprising curing the chemical bonding agent.

5. A process according to claim 1, wherein the monospheres comprise SiO_2.

6. A process according to claim 1, wherein the monospheres comprise a polymeric material.

7. A process according to claim 1, for the production of inverse opal-like sphere based crystals comprising:

(a) adding monospheres to the moving bed filtration membrane;

(b) moving the monospheres on the moving bed filtration membrane horizontally over

a vacuum filtration zone to apply vacuum filtration pressure to the monospheres to obtain packed monospheres;

(c) processing the packed monospheres for stabilization by infiltrating the packed monospheres with a bonding agent; and

(d) removing the monospheric material to obtain an inverse opal-like structure comprising air-spheres.

8. A method according to claim 7, wherein the infiltrating step is accomplished while the packed monospheres are moving on the vacuum bed filtration membrane and while a vacuum filtration pressure is being applied to the packed monospheres.

9. A process according to claim 7, wherein the bonding agent comprises SiO_2, Al_2O_3, TiO_2, SnO_2, Fe_2O_3, ZrO_2, CeO_2 or Y_2O_3.

10. A process according to claim 6, wherein the polymeric material comprises polystyrene, polymethacrylate, or polyvinyltoluene.

11. A process according to claim 1, wherein the suspension has a concentration of monospheres of 2-50% by weight of solids in water.

12. A process according to claim 11, wherein the concentration is 10% to 20% by weight.

13. A process according to claim 1, wherein the vacuum pressure is ~400 to ~600 nm Hg.

14. A process according to claim 11, wherein the vacuum pressure is ~400 to ~600 nm Hg.

15. A process according to claim 12, wherein the vacuum pressure is ~400 to ~600 nm Hg.

16. A process according to claim 1, wherein the monospheres have a particle size in the range of 20 nanometers to 30 microns.

17. A process according to claim 14, wherein the monospheres have a particle size in the range of 20 nanometers to 30 microns.

18. A process according to claim 1, wherein the monospheres are deposited in a layer thickness of about 50 microns to 5 millimeters.

19. A process according to claim 1, wherein monospheres are deposited in a layer thickness of about 200 microns to 1 millimeter.

20. A process according to claim 18, wherein monospheres are deposited in a layer thickness of about 200 microns to 1 millimeter.